08-Jan-2019

Intelligence

1) Theories of intelligence
   - a) Spearman — 10/15
   - b) Thurstone — 10/15
   - c) Cattell — 10
   - d) Guilford — 10
   - e) Hierarchial Model – Vernon — 10
   - f) PASS - DAS — 20
   - g) Sternberg — 10
   - h) Piajet — 20
   - i) Multiple Intelligence – Gardner — 15

2) IQ constancy — 10

3) Limitations of IQ concept — 10.

4) Problems associated with measurement of Intelligence —10

5) History of Intelligence Testing — 10

6) Creativity — 20

7) Relationship between Intelligence & Creativity — 10

8) Recent trends in creativity — 10

(do only if extra time)

9) SBIT — 15

10) WAIS — 15

11) Aptitude — 10

12) Emotional & social Intelligence — 20

SHOUT
SHARE
IT

*Intelligence:- An aggregate or global capacity of the individual to think ~~purpos~~ rationally, act purposefully & deal effectively with his environment.

- Capacity ⟶ potential ability
- aggregate or global ⟶ wide range of tasks
- deal effective with the env. ⟶ intelligence facilitates successful adjustment in the world around him.

* Processing of info. in a manner that allows the individua to successfully deal with the challenges presented by the environment.

* Theories of Intelligence ⟶
  - ⟶ content or factor Theories
  - ⟶ Process Theories

* Content Theories /factor Theories

↳ deal with building blocks of ~~Ind~~ Intelligence

↳ what constitutes intelligence.

↳ what are the components of intelligence

↳ Since, we arrive at the components using factor analysis, it is also called 'factor theory'

a) Spearman
b) Thurstone
c) Cattell
d) Guilford
e) Hierarchial Theories

* Process Theories

↳ How intelligence can be used in problem solving

↳ How do we plan to remember something

↳ How do we go about decision making

↳ How do we encode & retrieve the information

↳ How do we use our intelligence to adjust in the world around us.

↳ They prefer to use the term 'cognition' over intelligence.

a) Theory of cognitive Development — Piaget
b) Triarchic model — Sternberg
c) PASS — DAS

* Spearman - 2 factor Theory of Intelligence

↳ Two factors Theory of Intelligence

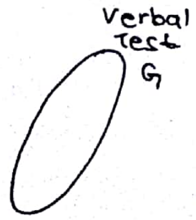
a) G factor → General Ability
b) S factor → Specific Ability

→ Every individual has 1 G & many S.

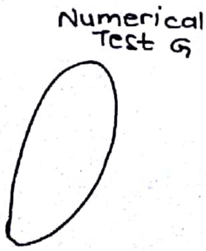
→ S → task specific factor
↳ narrow range

G → all encompassing
→ common to all intellectual tasks
→ in form of mental energy.
→ independent of race & sex
↳ constant

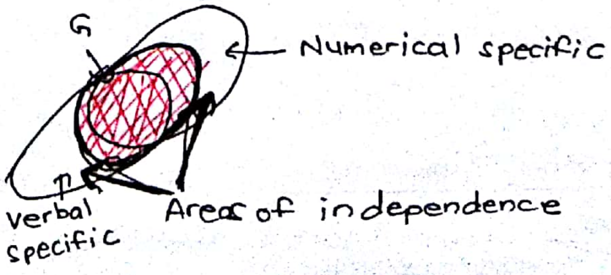
#


Verbal Test
G

8/10
(score)


Numerical Test G

$7\frac{1}{2}/10$
(score)


G
Numerical specific
Verbal specific
Area of independence

⇒ It cannot be 100% overlap as some specific factor will be involved.

⇒ 'S' happens to be independent of 'G' and independent of one another.

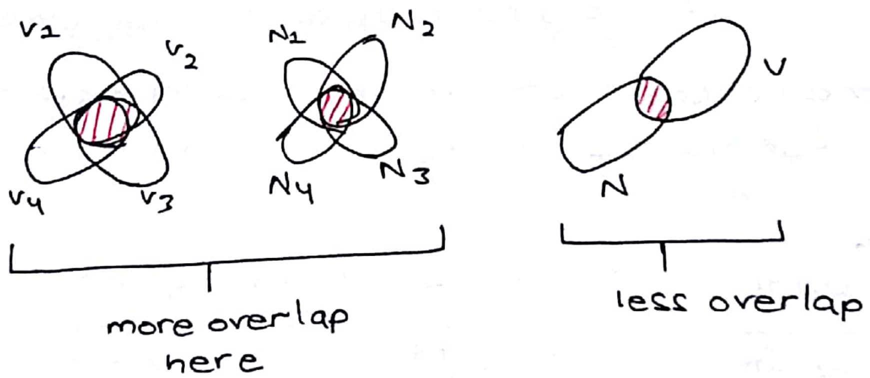
⇒ 'G' is inborn, 'S' is the result of training, educational & cultural experience.

⇒ All intellectual tasks should correlate with one another and this ~~coller~~ correlation should be above avg.

⇒ The extent of overlap that was obtained with respect to intra-ability test was much higher than one obtained on inter-ability test thereby throwing a challenge to his G-theory.

1) $V_1 V_2 V_3 V_4$ (4 verbal ability tests)

2) $N_1 N_2 N_3 N_4$ (4 numerical ability Tests)



⇒ Spearman said that the diff. in overlap is due to 'group factors' which are intermediate in scope.

G Gf S
↓
moderate scope

∴ $V_1 V_2 V_3 V_4$ ⟶ governed not just by G but also G_{fv} (~~G~~verbal) group factor)

⇒ He could not elaborate further on Gf.

He postulated the presence of additional G-factors
↳ perseveration
↳ oscillation
↳ will

- perseveration → inertia in supply of an individual's mental energy.

- oscillation → Extent to which individual fluctuates while taking the task.

- will → emotional & motivational component of the individual → This leads to commitment to the work.

⇛ Critical Evaluation

+ves

(i) He came up with the concept that 'G' is independent of race & gender (big revelation for his times)

(ii) Through, the concept of 'G', he could explain the better performance of some individuals in diff. tasks.

(iii) He could address 'Nature - Nurture' controversy.

$\boxed{\text{Nature} \rightarrow G}$ $\boxed{\text{Nurture} \rightarrow S}$

(iv) He could also explain that why people with low G, could perform exceptionally in a narrowly defined area → due to S (which is independent of G and one-another)

Such people are called → 'Idiot Savants'

(v) Without his work, many sophisticated models of intelligence available today would not be possible.

⇒ Today 'G' has been proved (just scope has reduced)

Limitations

(i) Group factors → Later expanded → multi factor approach to intelligence.

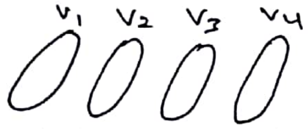
He did not elaborate on the Group factors. This was the limitation.

* Thurstone - Weighted Group factor Theory of Intelligence

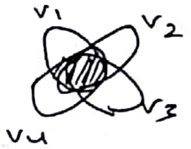
↳ denied the concept of G & S

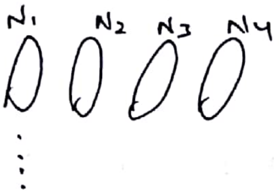
↳ intelligence consists of group factors intermediate in scope.

↳ 7 PMA (Primary Mental Abilities)

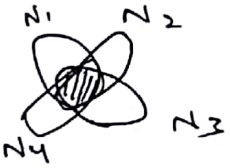


(verbal Ability)





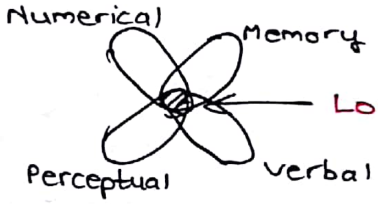
(Numerical Ability)



7 such mental Abilities were discovered.

⇒ One test is not enough to test intelligence, diff. tests should be used to find these PMAs → inside 7 sub-tests

⇒ **Inter-ability Test**


Numerical
Memory
Perceptual
verbal

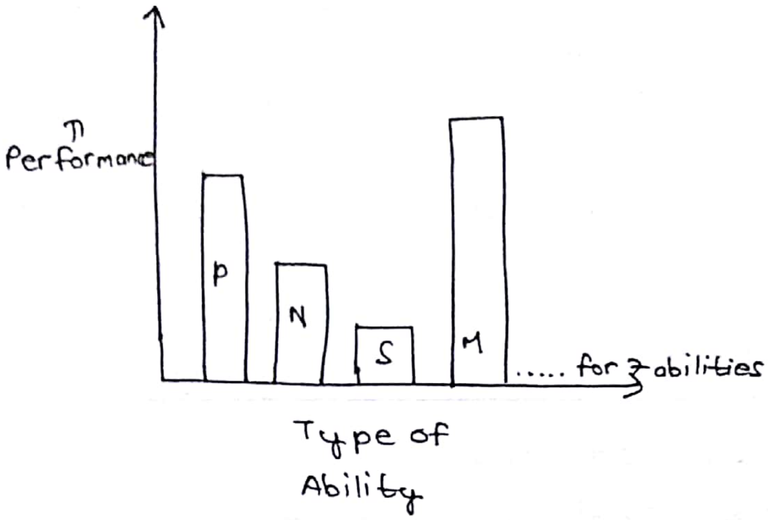
Low correlation (insignificant)

* 7 Primary Mental Abilities

1) P → Perceptual
2) V → Verbal
3) S → Spatial
4) M → Memory
5) R → Reasoning
6) N → Numerical
7) W → Word fluency

(Psychographs)

Psychogram



(i) Perceptual → ability to identify objects quickly & accurately as required in map work.

(ii) Verbal → ability to understand & utilize verbal ideas

(iii) Spatial → deal with the objects in space as required in 3D geometry or stereo-chemistry

(iv) Memory → retain & retrieve previously learned information

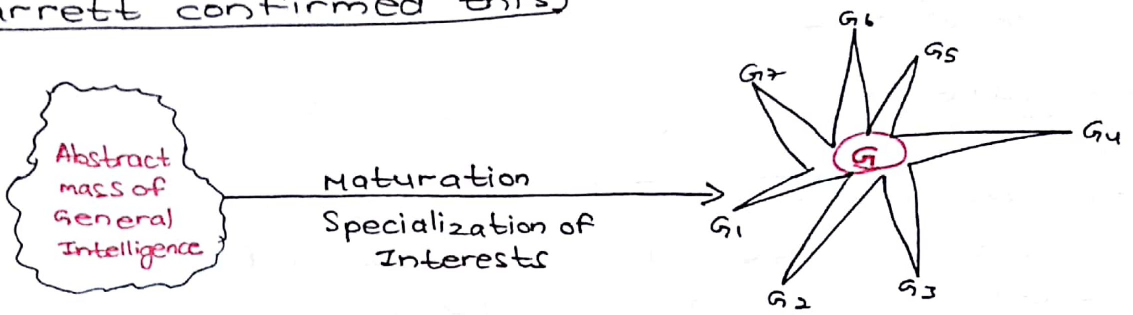
(v) Reasoning → understand & utilize abstract relationships.
(put together past experiences to solve problems)

(vi) Numerical → Ability to carry out fundamental arithmetic operations of +, −, ×, ÷

(vii) Word Fluency → Ability to think about the words quickly & accurately
(only ability which is associated with both individual's intelligence & personality)

* It was found that inter-ability test overlap in children is not that insignificant that it can be ignored.

*(Garrett confirmed this)


Abstract mass of General Intelligence
Maturation
Specialization of Interests
G
G1
G2
G3
G4
G5
G6
G7

⇒ There occurs a branching from abstract mass into various group factors.

⇒ Thus, with children, measurement of intelligence with a single test is possible but with ~~[illegible]~~ adults we need sub-tests.

⇒ Group-factors ⇒ not valid in children

* Cattell → 2 types of Intelligences

(i) Fluid Intelligence
(ii) Crystallized Intelligence

Both are distinct but correlated

* Fluid Intelligence → biologically determined
→ culture free
→ genetically determined
(similar to Spearman's G)

→ Non-verbal tests are required to measure this (culture free)

⇒ It is used to get insight into complex relationships

* Characteristics

(i) demonstrate general brightness
(ii) exceptional ability to acquire new concepts

(iii) Ability to adapt in novel situations

* Crystallized Intelligence

↳ investment of fluid intelligence in the higher order skills of the culture to which one is exposed.

↳ acquired knowledge + skills developed

(Cattell ~~sir~~ said that fluid int. will develop only till 16 yrs and then it declines but crystallized intelligence ~~can be improved~~ will keep developing and then stabilize.)

eg. with old age, ability to acquire new skill is lost but the domains in which investments were made, good performance continues to be displayed)

09-Jan-2019

* Fluid Intelligence → Raven's Progressive (RPM) Matrices
(similar to Spearman's G)

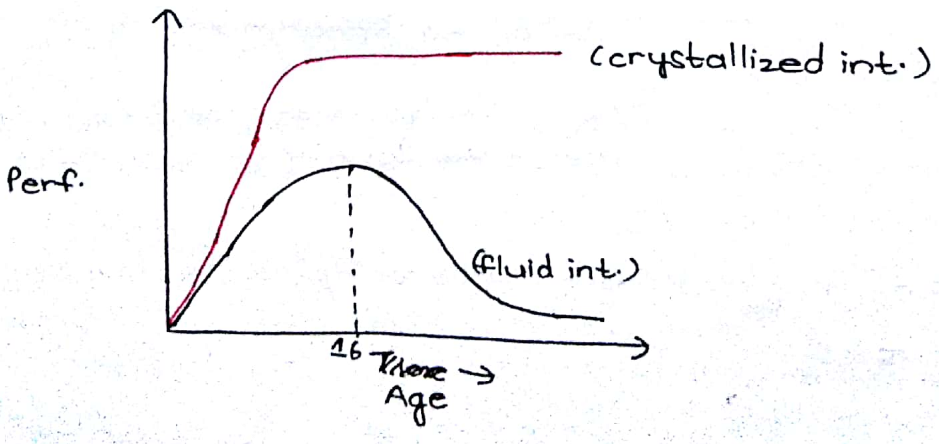
⇒ Performance scale of WAIS (Wechsler Adult Intelligence Scale)

⇒ Working memory is example of fluid intelligence.

* Long Term Memory → Crystallized Intelligence

⇒ Better fluid ~~me~~ intelligence → better crystallized Int.

⇒ Also known as G_f - G_c model



- fluid intelligence → association area of brain (max. found in pre-frontal cortex of brain)

- Crystallized Intelligence → hippocampus & projection area of the brain.

* Many people do not agree that it declines after the age of 16.

* Fluid intelligence is also involved in inductive & deductive reasoning.

* Guilford's Model - 3 Dimensional Structure of Intellect Model

→ 120 unique abilities
150 " "
180 " "

↓ Time

⇒ Then, he gave modified structure of Intellect model

150 I order abilities
85 II " "
60 III " "

* (Hierarchial Model)

* 3 Dimensions

1) Content
2) Operations
3) Product

⇒ When operations are carried on content, result is the product.

* There are 4 contents, 5 operations & 6 products

$4 \times 5 \times 6 = 120$ abilities

*4 contents

(i) Semantic
(ii) Symbolic
(iii) Behavioural
(iv) Figural → Visual
  ↳ Auditory

* 5 Operations

(i) Memory → Recording
  ↳ Retention
(ii) Evaluation
(iii) Convergent Production
(iv) Divergent Production
(v) Cognition

* 6 Products

(i) Units
(ii) Classes
(iii) Relations
(iv) Transformation
(v) Implication
(vi) Systems

⇒ As figural divided into 2, it become 150 (5X5X6)

⇒ Later memory " " 2, it became 180 (5X6X6)

Contents

- (i) Semantic :- mediated through meaning
- (ii) Symbolic :- mediated through letters
  ↳ Info. perceived through symbols & signs which have no meaning.

(iii) Behavioural :- mediated through actions of others eg. LEMOX → symbolic   COMPLEX → Semantic

iv) Figural → info perceived throug hearing → visual
" " " seeing → auditory

Operations

eg. CLEMPOX ⟶ operation ⟶ COMPLEX

(i) Memory → Recording :- encoding
↳ Retention :- recall

(ii) Evaluation ⟶ judge wisely while behaving
(when I carry out some behaviour, whether it is accurate, whether it is in the right direction)

(iii) Convergent Production
↳ to synchronise large amount of info to reach correct solution

Problem $\xrightarrow[\text{the rules}]{\text{applied}}$ Solution (only solution possible)

(iv) Divergent Production
↳ many solutions possible

(v) Cognition
↳ awareness about meaning of the words & concept

* Products

Contents $\xrightarrow{\text{operation}}$ Product

(i) Units :- single item of knowledge
eg. seeing an animal & identifying it as a liger.

(ii) Classes

↳ interrelated units will form class
eg. feline

↳ units which share common attributes → classes

(iii) Relations

↳ some units have relation bet. them
(analogies, associations, sequence, opposites)

(iv) Transformation

eg. Plan + t ⇒ Plant

↳ changes & mutation of knowledge → how they occur

(v) Implication

↳ anticipation or prediction

(vi) Systems

↳ action plans
eg. relationship bet. diff. structures of a system

Acronyms

Products → CITRUS
Contents → B(S)F
Operations → MEC + PP

* Critical Evaluation

+ves

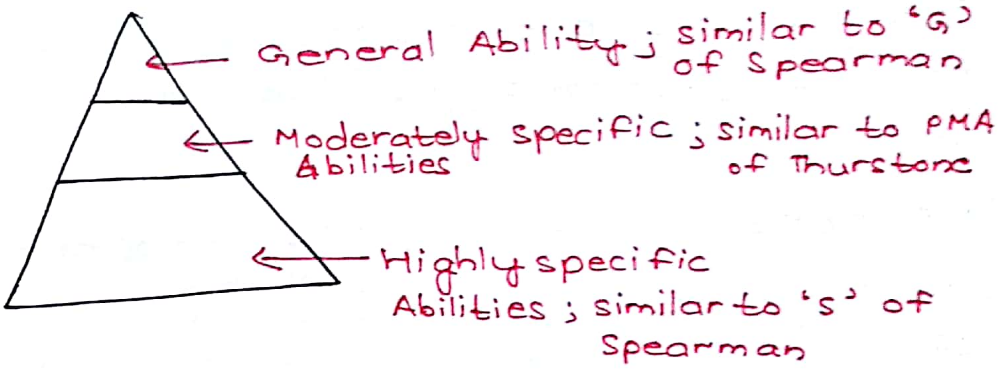
(i) Breadth → very comprehensive

(ii) He tried to correlate intelligence & creativity
(iii) Talked about behaviours of others → social intelligence

-ves

(i) cumbersome
(ii) intricate
(iii) elaborate
(iv) Demanding

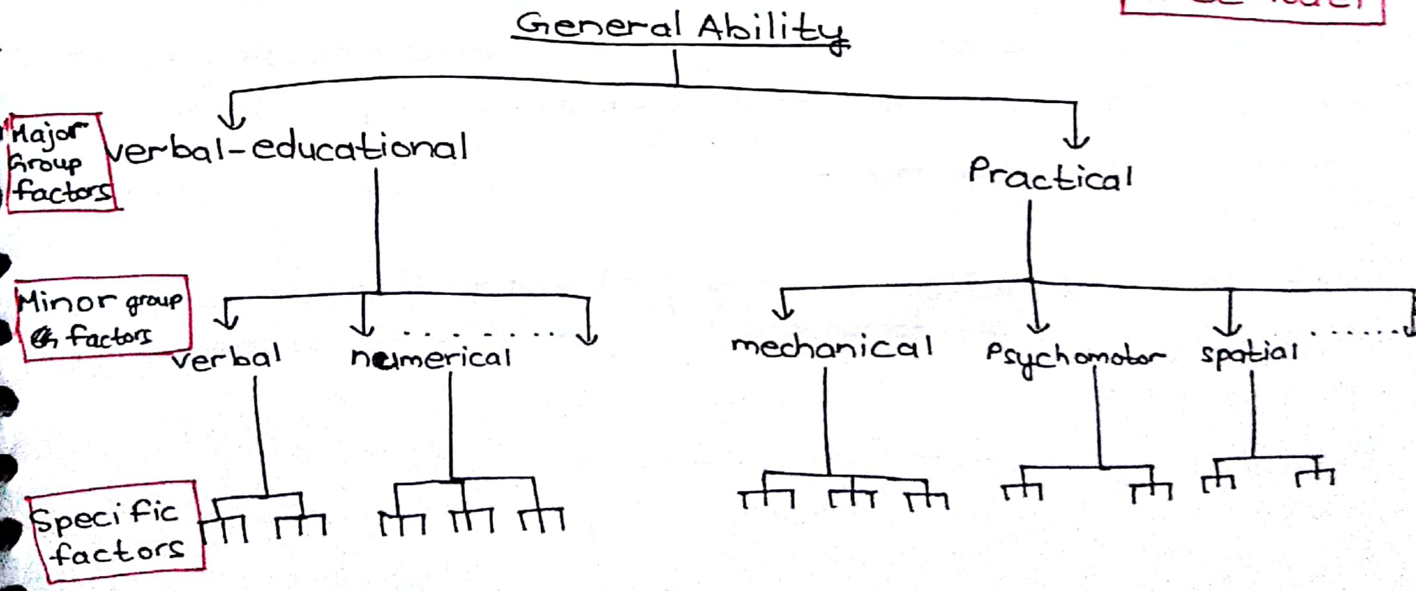
* Intelligence is a multi-layered pyramid


General Ability ; similar to 'G' of Spearman
Moderately specific Abilities ; similar to PMA of Thurstone
Highly specific Abilities ; similar to 's' of Spearman

Recent Dev. in Intelligence → Hierarchial Model

* Vernon – Hierarchial Model

Tree Model


General Ability
Major Group factors
verbal-educational
Practical
Minor group factors
verbal
numerical
mechanical
Psychomotor
spatial
Specific factors

Latest → CHC Model (Cattell, Horn & Carroll)

* It is widely recognised as the most empirically validated theoretically & structurally valid model of human ~~intelligence capabilities~~ cognitive abilities, endowed over 100 yrs of psychometric based research.

This model has resulted in the fusion of Gf - Gc model of Cattel & Horn & 3 stratum model of Carroll.

CHC theory is a hierarchial model of model of human cognitive abilities that consists of 3 strata.

(i) General intelligence (stratum 3)
(ii) Broad cognitive abilities (" 2)
(iii) Narrow " " (" 1)

The Broad cognitive abilities include abilities like processing speed, fluid reasoning, auditory processing, ~~physiosp~~ visual-spatial abilities, STM, cognitive processing speed, psychomotor abilities, reaction time or speed, quantitative knowledge, etc. The broad cog. abilities subsume approximately 70 narrow cog. abilities

CHC model is particularly relevant for school psychologist for the purpose of psychoeducational assessment.

* Piaget – Cognitive Development

→ Piaget is a constructivist & he believes in individual constructionism.

→ He called his approach as Genetic Epistemology

- Genetic → it deals with origin & development
- epistemology → it deals with acquisition of knowledge

→ Acc. to him, cognitive dev. proceeds through 4 stages, the order of which is invariant.

(i) Sensorimotor
(ii) Pre-operational
(iii) Concrete Operations
(iv) Formal Operations

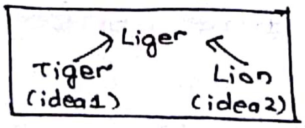
→ He believed that Human intellect is constructed over time as individual experiences progressively complex interactions with his env.

→ Initial source of cog. development is biological but rate & pace is determined by env. factors.

2 processes a) Organisation
b) Adaptation

- **Organisation** → different elements within a system maintain communication

eg.



- **Adaptation**
  - ↳ Assimilation
  - ↳ Accomodation

They will lead to equilibration.

*Assimilation → altering external reality to suit the underlying schema or cognitive structure.

* Accomodation → altering internal cognitive structure as per external reality.

⇒ This is example of concept learning

Equilibration → remain in equilibrium with the env.

Assimilation
&
Accomodation

$\Big\rangle$ Motivation to reach equilibration

⇓

*It facilitates equilibration by filling in the gaps present in our knowledge structure

4 stages

(i) Sensorimotor (0 – 18 months)

Reflex Actions → Intentional Movements → elementary means-end relationship

⇒ Major accomplishment in this stage → object permanence/constancy

* objects continue to exist even when no longer present in front of the senses → object permanence

(ii) Pre-operational (2-7 years)

a) language development / acquisition
(language will provide symbols for thinking)

b) Egocentric Thinking

↳ not able to understand that others can have a diff. perspective on the same issue.

c) Thinking is perceptual

↳ not based on concepts but on appearance

d) Thinking is animistic

animism :- belief in presence of soul in non-living things

e) child begins to use classes but inaccurately

f) transductive thinking

↳ from specific to ~~d~~ specific

from general	to	specific	→	Deductive
" specific	"	general	→	Inductive

sp. to sp. eg. → if both apple & mango are available from trees then why it is that only apple is available on the tree.

(rigidity in thinking)

g) Representational Thought

↳ eg/pr → Delayed imitation

(eg. Piaget's daughter imitating the behaviour of his friend's son)

→ Learn a behaviour & use it at an appropriate time.

→ Represent the events symbolically in your mental structures.

h) Primitive identity concept

↳ linked to gender identity & personal identity

↳ realisation that certain properties eg. length of a rigid object will not change if object's location is

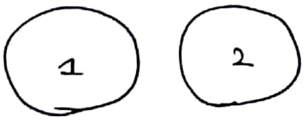
* Primitive → they are not fully confident about it & they give way easily (if pressurised), will not be able to retain his point.

⇒ Conservation of volume (to be mastered in next stage) will go through primitive identity stage.

(iii) Concrete Operations (7 to 11yrs)

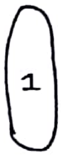
a) Egocentric thinking overcome

b) Conservation principle mastered



Identical clay balls

One ball rolled in a sausage



⇒ If you ask the child which contains more clay, he will say that both have same.

Sub-principles involved

(i) Reversibility → sausage can be rolled to get the ball back.

(ii) Compensation → sausage may be thinner but the thinness has been compensated by length

(iii) identity → understanding that nothing has been added to or subtracted from the ball.

(Previously, kids will have centration → ~~de~~ focus on only 1 detail)

⇒ Certain physical attributes won't change even when the outward appearance has been altered.

c) Logical thinking starts

↳ but only for concrete objects
eg. kids will not be able to rotate things mentally & tell front view & top view, though they know that it will look differently.

(iv) formal operations (11-18)

↳ inductive, deductive, logical, spatial, hypothetical, etc. abilities developed.

↳ no further cognitive growth.

10-Jan-2019

* Limitations of Piaget's Theory

1) Methodology → Naturalistic Observation → C-E relationship speculative.

2) Piaget is an individual constructivist → underplayed the importance of caregivers (social interaction with caregivers) in Cognitive Development.

Vygotsky → social constructivism

3) Piaget is a stage theorist → their theory of developmen
will be discontinuous
↓
but we understand that it is gradual, continuous & incremental.

(All stage theorists except Ericson never talked about transition phase between the diff. stages)

4) underestimated the cognitive abilities of children
(object permanence is achieved as early as 4-5 months)
(order in which the stages develop is universal but the time Period is debatable)

5) Piaget gave the idea of ego centric speech & considered it a cognitive limitation.

But Vygotsky considered it to be private speech (an asset in problem solving; they give suggestions to themselves)

[Freud & Piaget's approach was similar to Grounded Theory Approach]

* Sternberg – Triarchic Theory

(based on factors)

↳ He was the first to move from psychometric approach to cognitive approach to intelligence.

→ From factor approach to component approach

→ From structural to functional

→ from individual differences to individual commonalities.

* Intelligence is how an individual adapts & deals with environmental changes throughout the lifespan.

(i) Componential Intelligence → Info. processing approach
(ii) Experiential Intelligence → creativity
(iii) Contextual Intelligence → socioemotional Intelligence

(i)
* Componential Intelligence → (a) Metacomponent
(b) Performance component
(c) Acquisition "
(d) Transfer "
(e) Retention "

- **Meta component**
  - ↳ Decision making & problem solving.
  - ↳ executive planning

- **Performance component**
  - ↳ implements metacomponent
  - ↳ will involve encoding & comparing

- **Acquisition Component**
  - ↳ To acquire new learning or knowledge

- **Transfer component**
  - ↳ to apply learning from one setting to new settin

- **Retention component**
  - ↳ storage & retrieval of information.

(ii)
* **Experiential Intelligence**

↳ the ability to correlate those things which seem to be unrelated to most.

Requirements

↳ identify critical info.

b) relate unrelated things

↳ Abstraction & Generalisation

(iii) **Contextual Intelligence**

↳ to meet the challenges of changing environmental situation

↳ also known as Practical Intelligence (practical response is required)

⇒ He gave people → problem solving tasks & based on the result, he identified which component people were lacking → remedial orientation (profiling was done)

~~He~~ Further he gave;

(i) Mental self govt.

(ii) Intellectual style

(i) Mental self govt.

↳ result of cross-fertilisation between personality & intelligence.

↳ strategies adopted to solve the problems are dependent on the personality also

(ii) Intellectual style

↳ how the 3 types of intelligence are used by an individual

* DAS – PASS model

P :- Planning
A :- Arousal & Attention
S :- Simultaneous
S :- Successive

- Before him, there was unidimensional conceptualisation of intelligence → he offered an alternative to this
- His model is based on ~~rea~~ research in neuropsychology & cognition
- Provides a theory for both assessment & intervention

Das, Kirby & Jarman – 1975 gave this concept

Improved upon by Das, Kirby & Naglieri in 1994

* The model is based upon 4 basic rules regarding intelligence.

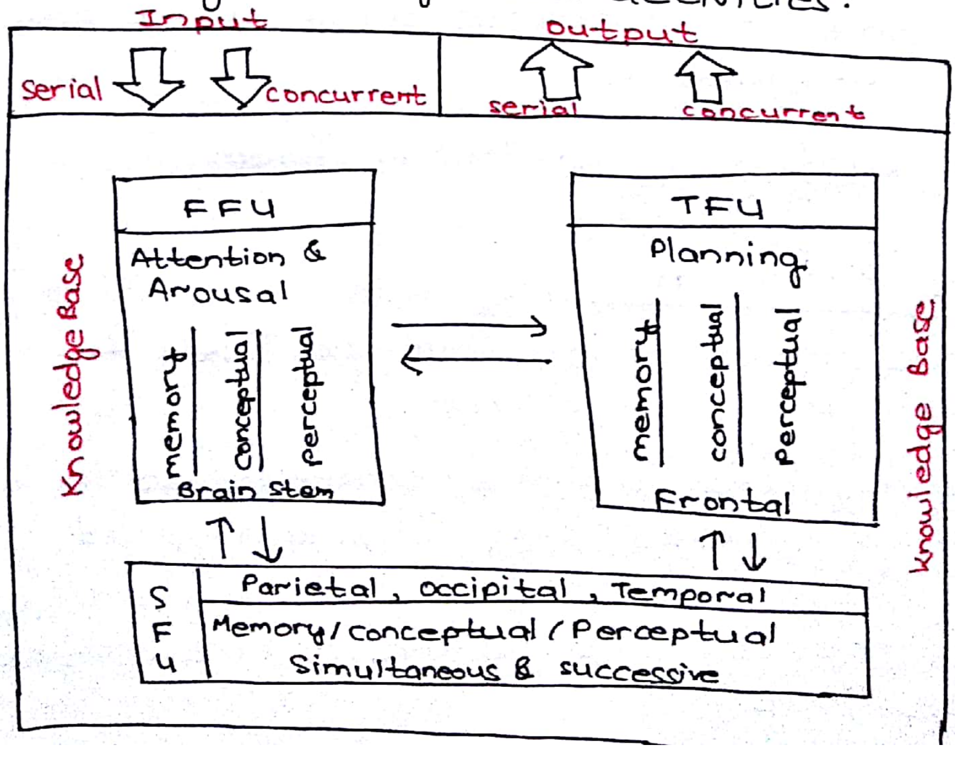
1) Intelligence is not IQ. It is a cognitive process.
2) Intelligence changes due to learning & cultural demands
3) Some aspects of intelligence are domain specific & others are domain specific
4) Modules exist in brain for explicit purpose of characterising & dealing with information processing.

2 very imp. info. processing tasks acc. to him.

(i) Language
(ii) Pattern Recognition

⇒ Blueprint of work by DAS was provided by Luria who described human cognitive functioning in the framework of 3 functional units

a) One that regulates attention & arousal.
b) Other that codes for simultaneous & successive processes
c) Third that provides for planning, self monitoring & structuring of cognitive activities.


Input
Output
Serial
concurrent
serial
concurrent
FFU
Attention & Arousal
memory
conceptual
perceptual
Brain Stem
TFU
Planning
memory
conceptual
perceptual
Frontal
Knowledge Base
Knowledge Base
SFU
Parietal, occipital, Temporal
Memory / conceptual / Perceptual
Simultaneous & successive

FFU:- first functional unit

- **Planning** :- Frontal lobe
  - ↳ critical to problem solving
  - ↳ generation of activities & strategies needed to solve the problem.
  - ↳ control attention & simultaneous & successive processes
  - ↳ Selective utilization of knowledge

- **Arousal & Attention**
  - ↳ Arousal keeps the people awake & arousal activities are associated with brain stem & to some extent Thalamus
  - ↳ Attention is associated with frontal lobe activities
  - Deployment of concentration on the stimulus of interest.

- **Simultaneous Processing**
  - ↳ Simultaneous Processing is needed for the organisation of info into groups or coherent tasks.
  - ↳ Parietal, occipital & Temporal regions of the brain are associated with it.
  - ↳ Simultaneous processes allow us to see interrelated events or elements.
  - ↳ visual-spatial dimensions in them

- **Successive Processing**
  - ↳ Successive processes are involved with the stimuli arranged in serial order
  - ↳ whenever info. is to be remembered in a specific order, successive processes are involved

* All the processes are active in the context of Knowledge Base

* CAS

↳ instrument created by Das & it measures PASS.

* Instruments of Das

(i) CAS (Cognitive Assesment Scale)

Individually administered test designed for children & adolescents in the age group 5-17yrs. The test consists of 12 sub-tests, 3 each of the 4 PASS scales. There is also a total score called as the full scale. CAS is a measurement inst. that can be used to determine an individual's competence & level of cognitive functioning. It can be used for eg. to diagnose learning strengths & weaknesses, learning disabilities, attention deficiencies, mental retardation & giftedness. The scores on this inst. can guide decisions on appropriateness of treatments & instruction programmes.

One possible use of CAS is to diagnose children with Attention Deficit Disorder (ADD). Such children score lower in attention than in planning or simultaneous & successive processing. If such children's IQ is measured, it will fall in normal range. Therefore, a single IQ score based on the notion of gen. intelligence is of no use as it does not provide cognitive profile. PASS model has been able to distinguish between individuals who have a specific reading disability (Dyslexia) & those who are simply poor readers. Individual with true Dyslexia have specific deficit in successive processing. Their reading problems are specific & they make phonological errors while reading words & are slow in reading them.

Based on the framework provided by PASS model, DAS developed a prog. called PREP (PASS Reading Enhancement Programme). It is a remedial prog. for primary school children who are experiencing difficulty with reading spelling & comprehension. This prog. aims at improving info. processing strategies that underlie reading while avoiding the direct teaching of the word reading skills. The method is founded on the premise that it is easier for the children to learn these strategies by inductive rather than deductive means.

Aptitude

1) Capacity

2) Ability

3) Achievement / Proficiency

4) Aptitude

5) Intelligence

(i) Capacity :- max. ability

(ii) Ability :- power to perform designated task
  ↳ Innate
  ↳ Acquired
  ↳ Potential
  ↳ Actual

(iii) Achievement / Proficiency
  ↳ extent to which the given ability has already been acquired.

(iv) Aptitude

↳ will acquire in time to come if provided with proper training.

↳ ~~ma~~ Intelligence over narrow range

(v) Intelligence

↳ Broad based Aptitude

- Freeman defined aptitude as a combination of an individual's characteristics indicative of an individual's capacity to acquire with training some specific knowledge & skill of organised responses such as the ability to speak language, to become a musician, to do a mechanical work, etc.

- Warren defined aptitude as a set of conditions or a set of characteristics regarded as symptomatic of the individual's ability to acquire some (usually specific) knowledge, set of skills or specified responses such as ability to produce music, speak some language, etc.

11-Jan-2019

Conclusion

(i) Aptitude refers to future potentialities

(ii) Innate or acquired

(iii) Refers to fitness or suitability for activities in question

* Aptitude Testing

(i) Aptitude vs Achievement Test

(ii) Challenges associated with aptitude Testing

(iii) Assumptions in aptitude testing

(iv) Aptitude vs intelligence tests

(v) History of Aptitude Testing

Freeman

↳ Aptitude test is one designed to measure person's potential ability in activity of a specialised kind & within a restricted range.

Achievement test measures how much an individual has profited from the instruction or training he has been provided.

Achievement Test	Aptitude Test
(i) Past Centric	(i) Future centric
(ii) higher validity than aptitude test	(ii) lower validity
(iii) measures what person has learned	(iii) measures what person can learn
(iv) measures performance under relatively controlled settings	(iv) Aptitude tests include multiplicity of experiences of daily life.
(v) Content validity	(v) predictive validity

* A single test can act as an aptitude test as well as achievement test.

⇒ Some scholars, rather than classifying into two, use the term 'Test of Developed Abilities'.

⇒ Content validation is always easier than predictive validation.

* Assumptions in aptitude testing

(i) Individual differ in their potentialities.

(ii) Differences are stable over time.

(iii) Not all potentialities of an individual happen to be equally strong.

(iv) Every measurement of an aptitude will admit some scope for error variance.

*History of Aptitude Testing

⇒ Spearman gave G-factor

⇒ Intelligence Test that can measure 'G' was developed.

⇒ Specialised abilities could not be measured by single intelligence test → Along with General Intelligence test, specialized abilities test.

↓

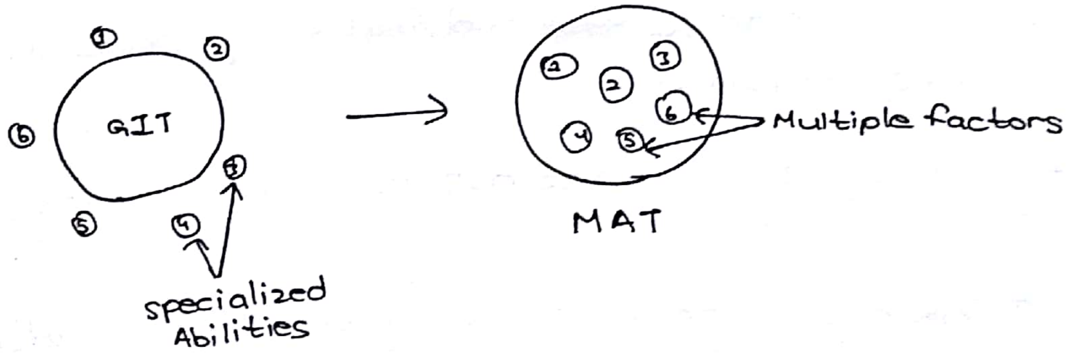
(i) General Int. Test (GIT)

(ii) Specialized aptitude Test

* Later, from single factor → multi-factor

↓

Multiple Aptitude Tests (MAT)



* Aptitude & Intelligence (Both are potential ability tests)

Aptitude ↓ specific range

Intelligence ↓ broad range

* Intelligence Test → Cognitive Domain

  Personality Test → Non-cognitive Domain

* Motivation, emotion, attitude, values → Non-cognitive (even if cognitive element is present, it is very less)

* Previously it was believed that intelligence & personality are different but now it is believed that they are ~~in~~ correlated.

* **Challenges in aptitude testing**

(i) **Definition**

a) Factors that constitute the attribute

b) Weights attached to different factors

c) Questions /items to be generated

d) How to include them in single test (length of the test)

Creativity

* Ability to generate novel & productive ideas.

* Maltzman → 'originality evaluated'

* Israeli → Ability to produce / generate new idea or rearrange the old / existing ideas in a novel fashion.

* Creativity involves unconscious rearrangement of symbols.

* Creative Thinking proceeds very slowly & suddenly a new idea arrives in the awareness.

* Kris → 4 characteristics of creative thinking
  - (i) Sudden unexpected arrival of the ideas.
  - (ii) Ideas arrive out of nowhere
  - (iii) Ideas occur in a relaxed condition
  - (iv) creative Thinking involves gradual emergence from conflict.

*Steps/Stages in Creative Thinking (given by Graham Wallas)

(i) Preparation

(ii) Incubation

(iii) Illumination

(iv) Evaluation

(v) Revision

(i) Preparation

↳ Define the problem

↳ collect the relevant info.

↳ start thinking of the solution

(ii) Incubation

↳ unconsciously the thought process are at work (after conscious effort is given up)

↳ interfering associations or bottlenecks will be removed.

(iii) Illumination

↳ solution coming his way

(iv) Evaluation

↳ assess whether the arrived solution solves the problem (if not go back to step 1)

(v) Revision

↳ Lay down the steps followed to reach the solution.

* Characteristics of Creative Thinkers

(i) They are psychodynamically complex

(ii) Assertive & Dominant

(iii) Do not use suppression as a mechanism to control their impulse

(iv) They are independent in their judgements.

(v) Prefer some degree of ~~into~~ apparent imbalance in the phenomena.

• Cattell

(i) Scientific creatives peak in their 20's & literary creatives peak in their 40's because scientific ~~creati~~ activities involve more of analysis & literary activities involve synthesis.

(ii) Creative people have lower incidence of neuroticism in comparision to general population.

(iii) They show greater emotional stability than gen. population.

(iv) In comparision to scientific creatives, literary creatives are somewhat emotionally unstable.

• Dennu

(i) willingness to recognize their irrational impulses.

(ii) Less dogmatic & more relativistic viewpoint of life

(iii) High levels of emotional stability & ~~the~~

(iv) Sense of Humour

• Rogers

(i) Internal locus of evaluation (not bothered about other's perception of ~~the~~ his)

(ii) Openness to experience

(iii) Ability to play with the ideas & concepts

*** Welsh**

(i) Creative people have '**origence**'
- they like to do their own thing.
- prefer to create their own path.
- prefer not to follow the path of others even when in doing so they stand the risk of being branded as rebellious.

*** Wallach & Kogan**

studied 4 types of people
- High Int. & High Creativit
- HI & LC
- HC & LI
- LI & LC

(i) HI & HC
- High self esteem
- performed excellently in school
- were popular among their teachers

(ii) HI & LC
- addicted to school curricular
- some exam anxiety
- school performance admirable

(iii) HC & LI
- feelings of inferiority & inadequacy
- maladjustment with peers & teachers
- ~~underachievement~~ underperformance in school subjects.

(min IQ is 120, it is relative to ~~Int~~ creativity)

(iv) LI & LC

- ↳ in state of confusion
- ↳ extreme anxiety due to persistent failures
- ↳ some develop psychophysiological disorders
- ↳ very poor school performance.

* Creative People → Intelligence is above average.

15-Jan-2019

Creativity

Types of thinking involved in creative solution finding

(i) Convergent Thinking
(ii) Divergent Thinking
(iii) Autistic Thinking

(i) Convergent Thinking

1) End result focused
2) Reach a solution that has been reached by some one else earlier.
3) Synchronise large no. of ideas or info to reach one correct solution.
4) Initial stages of creative solution finding → collect the info that will be useful in reaching the creative solution.

(ii) Divergent Thinking

1) Expansion from a limited amount of info. to reach many diff. solution.
2) One can reach a novel solution.
3) Bedrock of creative thinking.

(iii) Autistic Thinking

1) Involves free & fertile flow of ideas.
2) Symbols have a personal meaning & little regard with reality.

* Acc. to Guilford, concomitants of creativity are:

(i) Fluency → number of ideas
(ii) Flexibility → variety
(iii) Originality → unusual ideas
(iv) Elaboration → ability to improve upon or extend the present ide
(v) Redefinition → define the existing concept in a novel fashion.

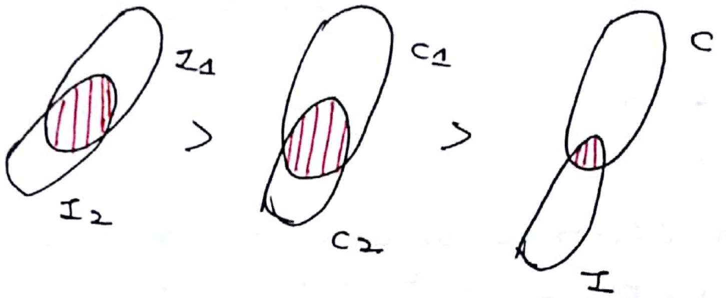
Intelligence - Creativity Link

Correlation is

(i) low but +ve

(ii) ~~High~~ ~~int~~ Above avg. intelligence is necessary but not sufficient condition for creativity.

(iii) I & C are independent but only at upper end of the distribution.



Decreasing correlation ~~convergence~~ ⟶

* The variables in I & C are diff.
- ↳ Intelligence is only cognitive
- ↳ Creativity is cognitive + personality (non-cognitive)

Thus, it is far more easier for scholars to find consensus ~~concension~~ on the definition of intelligence than on that of creativity.

⇒ Validity of creativity test cannot be as high as that of intelligence test.

⇒ After IQ of 120, other factors will also play a role in determining creativity.

* Intelligence & creativity have low but +ve correlation. For the general population, the scores on IQ test are +vely correlated with those on creativity test. In other words people with above avg. IQ tend to have above avg. score on intelligence test but beyond a certain level (IQ - 120 & above)

there is little relationship bet. I & C. Thus, I & C are independent of each other but only at the upper end of the distribution. This has led the experts to propose threshold model of creativity which suggests that certain level of intelligence is necessary before a person can give creative contribution in his or her line of work but beyond the threshold creative contribution depends upon a no. of other factors such as fluency of ideas, personality variables, etc. High IQ is not necessary for doing well in creativity but above avg. IQ is necessary.

* Ongoing debates:- (i) Do creative people think differently
or
Do they choose diff. problems to think.

(ii) Incremental or "All or None"

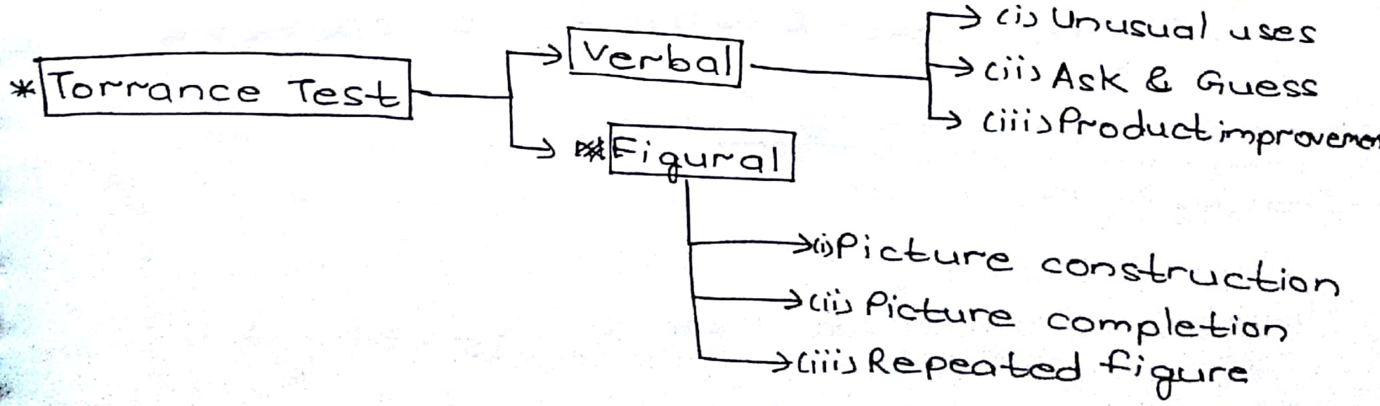
(iii) Role of unconscious

(iv) Can creativity be enhanced in a person

* **Measurement**

(i) Torrance Test

(ii) Remote Association Test


* Torrance Test
Verbal
(i) Unusual uses
(ii) Ask & Guess
(iii) Product improvement
Figural
(i) Picture construction
(ii) Picture completion
(iii) Repeated figure

- Scoring
  - (i) fluency
  - (ii) flexibility
  - (iii) originality

*verbal

- Unusual uses

↳ an object is given & uncommon uses of common objects should be given.

- Ask & Guess

↳ Show the kid a photograph & ask what has led to the scene & what will happen next.

- Product improvement

↳ kid is asked about improvements in the toy which can make it generate more fun while playing.

* figural

(i) Picture construction

↳ A picture has to be created on the basis of a stimulus.

(ii) Picture completion

↳ An incomplete picture has to be completed

(iii) Repeated figure

A figure is given & it has to be repeated eg. circle

*Remote Association Test

(given by Mednik & Mednik)

40 items & 40 mins.

eg. Frugal Miser Thrifty ⇒ Provide parsimonious

3 Remotely clustered words are provided, a 4th word is to be provided which can provide link bet. all 4.

challenges

1) creativity comes in Informal Settings (Relaxed atmosphere) → Creativity Tests provide formal settings.
↓
Relaxation gone

2) Creativity tests are timed, deadline pressure will hamper creativity.

3) Most of the tests measure divergent production but creativity also is dependent on personality (which is not being measured) → only cognitive factor is being measured.

4. Domain of creativity is so wide, tests are incomplete.

5. Deciding cut-off score in a creative test is a big challenge.

6. Designing of the test items.

7. Non-availability of satisfactory norms & criterion

8. Scoring of the test item

* Development of creativity

(i) General environment (ii) Home Env. (iii) School Env.

(i) a) Environmental stimulation → Disadvantaged children lack it due to sameness of the env. in which they function
↳ must match the cognitive readiness of the child.

b) Relaxed Environment
↳ mind is kept in some kind of constructive agitation
↳ env. should be non judgemental where half-baked ideas are not dismissed as stupid.

c) Nurturance
↳ reinforcement provided by the parents
(Intrinsic → doing something for the sake of the activity)
→ If intrinsic not possible then extrinsic is better than no motivation.

(If something is being done for intrinsic, don't provide extrinsic → it will overpower intrinsic motivation)

⇒ Overjustification effect

d) Presence of rolemodels

e) Learning opportunities

f) Norm of the family

↳ Authoritarian family stifles creativity

g) Opportunities for Experimentation

h) Constructive feedback

(ii) Home Environment

- Factors that block creativity
  - a) Authoritarian child rearing practices
  - b) Rigid disciplinary practices
  - c) Comparative orientation
  - d) Over emphasis on traditional behaviour
  - e) Lack of independence in decision making
  - f) Absence of encouragement for the new ideas generated
  - g) Low self esteem & high anxiety levels in the parents.

*Democratic rearing promotes creativity because:

a) independence training early in childhood

b) freedom in decision making

c) assume responsibility for their behaviour

d) Parents are warm but not indulgent.

- Pradip Khandwalla

↳ He found that individual's childhood env. is a strong predictor of individual's creativity. The more the childhood env. is congenial to creativity, greater is the likelihood that the person as an adult would want to innovate, pioneer & create & would be less concerned about his financial security. In his another study, khandwalla found that homes that provided the children to learn hobbies from creative instructors & the homes where diverse viewpoints were freely expressed, seemed to induce the child as an adult to choose creative life paths. Thus, early formative experiences at home tend to have far reaching consequences for the attraction that the person has as an adult for creativity & innovation.

- - - -

→ ~~Also~~ Sometimes, if parents are unresponsive, the child starts to imagine things which they did not get (but the child should have potential) → This also leads to creativity.

- - - -

(iii) School Environment

a) Principal's & Teacher's pro originality attitude.

b) Small classroom size.

c) Opportunities for exploration & experimentation.

d) Ego building behaviours. (encouragement)

e) Instructional space (teachers should be given freedom to use their own ways)

f) Flexible daily schedule

g) Immediate reinforcement & recognition of the creative performance

h) Provision for some open ended activities not tied to marks

i) Opportunities to interact with creative role model

h) Instruction that is compatible with the mental readiness of the child.

- In his study of 50 odd innovative professionals from India, Khandwalla found that some aspects of school env. to be particularly critical for later career & work choices. For instance, professionals educated in schools which emphasised the imp. of creators & innovators as role models, whose principals or influential teachers were themselves committed to creativity & encouraging it to their students & where reasonable facilities were provided to the students to pursue their wild ideas tended later in life to gravitate to the careers & work env. where creativity & innovation were honoured.

18-Jan-2019

* Recent trends in creative thinking

(i) How much is role of unconscious?

(ii) Is creative thinking 'all or none' process or is it incremental?

(iii) Are creative people creative in their approach to problem solving or creative in their problem identification?

→ Traditional Approach (Köhler)

(i) Unconscious

(ii) All or none

(iii) Approach- unique

Recent trends

→ Problem identification & problem representation

Weisberg has challenged the idea that creativity involves flashes of insight. He calls it "aha myth". Undeniably, bursts of insights do occur, however, the evidence suggests that major creative achievements generally are logical extensions of the existing ideas involving long hardwork and many small faultering steps forward. Creative ideas do not come out from nowhere. They come out from deep well of experience

& training in specific area. Creative accomplishments are born of intensive study, long reflection, persistence & interests.

Researchers today agree that there is no single creative process, rather, creativity is the result of many types of mental processes working together. Researches suggest that processes used to produce creative thoughts are exactly same as those used in producing non-creative thoughts.

They also believe that rather than focus on single type of creativity, it is important to construct global information processing model that can capture a variety of creative thoughts.

Cognitive psychologists today agree that creativity ~~emerges out~~ depends upon conscious processes and can be learned & enhanced to some degree. In creative exercise personality factors interact with intellective factors & creativity results when the problem has been adequately represented in the problem space.

* Perkins suggests that the hallmark of creative problem solving is an extensive exploration of possibilities before committing to an approach.

* Lubart & Sternberg have given 'Investment or Confluence Theory' of creativity. Acc. to which creative people are those who are willing & able to buy low & sell high in the realm of ideas. Buying low means pursuing

the ideas that are unown or out of favour but have growth potential. often when these ideas are first presented, they encounter resistance. The creative individual persists in the face of this resistance & eventually sells high moving on to the next new or unpopular idea. Acc. to Investment Theory, creativity requires a confluence of 6 distinct but inter-related sources & these are:

(i) Intellectual skills which include 3 types of skills.
  a) Synthetic skills
  b) Analytical skills
  c) Practical contextual skills

(ii) Knowledge of the subject matter

(iii) Thinking styles → preferred way of using one's skills. They are the decisions about how to deploy skills available to a person

(iv) Personality which includes
  (a) Self-efficacy
  (b) Willingness to take sensible risks
  (c) Willingness to tolerate ambiguity

(v) Environment which is supporting & rewarding of creative ideas.

(vi) Motivation → which is intrinsic & task focused

* Techniques to foster creativity

(i) Brain Storming
(ii) Questioning
(iii) Role Playing
(iv) Synectics
(v) Morphological Analysis

Challenges

(i) Open up → Drop inhibitions
(ii) To stay focused
(iii) Enable every member to contribute
(iv) Restraint from evaluation during idea generation process
(v) Ascendency of the unconscious mind

*Questioning

↳ In most questions rote memory is tested, reproduction of info & convergent Thinking.

↳ If we can give them questions that involve:
- a) Divergent Thinking
- b) Hypothetical ~~Think~~ Thinking questions
- c) Redefinition Questions

} increases creativity

* Role Playing

↳ Enacting a new role in a setting which is sheltered eg. people will not laugh but encourage if mistake is committed.

↳ Constructive & Descriptive feedback

↳ New lines of thoughts are generated (perspective of the person whose role is being played is understood.)

* Synectics

↳ comes from Greek word synecticos → fitting together the diverse elements.

↳ The technique was developed by Gordon & Prince

↳ To a noninitiate, it may seem as a mad method of creative problem solving.

→ **Based on 3 principles**

(i) Creative process can be taught & described.
(ii) Individual & group creativity are analogous.
(iii) Invention process in art & science are analogous & are driven by same psychic process.

This technique believes that most people can be creative if they know how creativity works & the technique involves making familiar things unfamiliar & unfamiliar things familiar.

↳ Strange ⟶ familiar

Familiar ⟶ Strange

- To allow Preconscious mind to assume dominance over conscious mind. (The conscious mind will not be able to ignore impediments in real life)

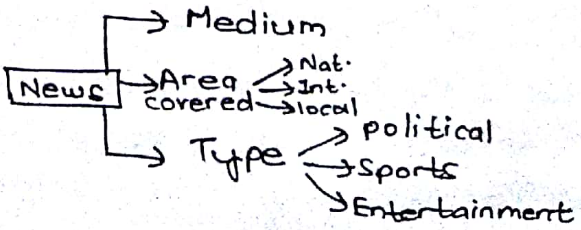
→ Unconscious mind thinks associatively, analogically

→ Not unlearning but trying to put new dimensions into the system eg. seeing a box as a bed.

* Morphological Analysis

↳ Dr. Zwicky

Suppose the topic given is



Derive all possible manifestations of the topic & then all sub manifestations → Then possible combinations of these.

⇒ A branched model will come up (out of which some combinations can be novel)

IQ Constancy

→ What is IQ
→ Is it constant
→ If it is constant what are the implications
→ If it is not constant what are the implications
→ Does constancy of IQ mean uniform rate of mental growth
→ Does IQ constancy imply uniform educational experience.
→ what empirical evidences challenge IQ constancy
→ What are in support

$$\boxed{IQ = \frac{MA}{CA} \times 100}$$

MA :- Mental Age
CA :- Chronological Age

Any Psychological attribute will be studied if:
(i) It applies to large no. of people (preferrably entire population)
(ii) Individual diff. of the attribute are stable over time

∴ IQ is constant

⇒ Children of one age group will get similar level of questions all around the world. (Uniform rate of mental growth & educational experience)

⇒ IQ Constancy → Test-retest reliability

Issues
*(i) When orphan children were adopted into foster homes → IQ level increased & this increase was proportional to the educational env. they got.
(Earlier the adoption, higher is the jump)

(ii)
⇒ Poor correlation in the IQ scores of children at the age of 2 yrs & then at the age of 6 yrs.

⇒ But very high order correlation between scores of 15 year olds and when they became 30 yr old

⇒ This shows that IQ measures for pre-schoolers are not reliable.

*We reject both of the above issues.

(i) a) children with better heredity will have better chances of getting adopted → But the change is minor (5 to 15 points)

b) IQ measures for orphans might not be accurate

(ii) In the initial years of life, env. inputs differ drastically → This leads to inconsistency in the performance.

eg. from crawling to walking stage, huge changes in the env. inputs

These diff. will not be much from the age of 15 to 30

So, we say IQ is constant.

* In most of the test for IQ, crystallized intelligence is measured & crystallized Int. becomes constant after age of 15.

⇒ Reliability of IQ tests in pre-school will not be as much as IQ tests of 15 years old.

* Problems in the concept of IQ

(i) $\frac{MA}{CA} \times 100$ ⇒ Mental age becomes constant, thus CA keeps increasing → with age IQ decreases

(ii) $\frac{10}{8} \times 100 = 125$

$\frac{5}{4} \times 100 = 125$

} The scores are same but they cannot be compared.

(iii) %age of mentally gifted & retarted are far more than what would be given by Normal Dist. Curve (It works in the middle but not at the ends) → (concept of deviation IQ came)

(iv) High IQ does not mean success in life

To cater to some of these issues ⟶ Deviation IQ (DIQ)

Also, diff. IQ Tests do not give same results.

Today, we understand that DIQ is effective but it is more of verbal + numerical (scholastic) ability only.

19-Jan-2019

Emotional Intelligence

- Thorndike → Social intelligence
  ("ability to deal with men, women, boys & girls")
  ↳ judge wisely in human relationships.

* Human management skills are a reflection of social intelligen
  ↳ Handle relationships effectively
  ↳ Social Quotient (SQ) (skills for human management)
  ↳ Social Quotient Inventory → to measure the skills

Skills required

(i) Patience
(ii) Tolerance
(iii) Sense of humor
(iv) Self Confidence
(v) Self Motivation
(vi) Conflict Management
(vii) Recognition of social env.
(viii) Tactfulness
(ix) communication
(X) Ability to exercise influence

2) Guilford → BSF model

3) Sternberg → confluence of int. & ~~persno~~ personality.

4) Gardner → Intra & Inter~~m~~personal~~ity~~ intelligence

Mayor
&
Salovey → Emotional Intelligence

- Daniel Goleman (in his book) → "EI → Why it can matter more than IQ"
  - ↳ 80 % job success → EQ
  - ↳ 20 % " " → IQ

→ IQ will get you selected but your EQ will get you promoted

- Sub-cortex (Cold brain) → limbic system (seat of emotions) → Decision Making & Problem solving
- Neo-cortex (New brain) → Brain bark (outer covering) → seat of intelligence → Decision Making & Problem solving

* EI → ability to regulate & recognize emotions in oneself & others.

→ ability to reason with emotions & use emotions in reasoning.

3 models of EI

Ability Model	Trait Model	Mixed Model
Salovey & Mayer	Bar-on Petrides	Goleman

* Ability model → Ability Tests

* Trait Model → Rating Scales ~~or~~ & Self - Report Inventories

* Mixed Model → Mix of both

* Ability model → cognitive Abilities (EI has to come if you have certain level of ~~[illegible]~~ Intelligence)

* Trait model → Non - cognitive Abilities

* Ability Model

(i) Perception & expression of emotions

(ii) Assimilation of emotions in thought (emotional facilitation of thought)

(iii) Management of Emotion
↓
~~(iii)~~ Reflective regulation of emotion

(iv) Understanding of emotions
(in oneself & others)

[4 Branch Model]

Mayer & Salovey developed 2 tests

(i) Mayer Salovey & Caruso Emotional Intelligence

(ii) Multifactor Emotional Intelligence Scale (MEIS)

* Emotional Intelligence (acc. to ability model) is a set of abilities that account for how people's emotional perception & understanding vary in their accuracy. EI is the ability to perceive & express emotions, assimilate emotions in thought, understand & reason with emotions & regulate emotions in self & others.

* Trait Model

→ Personality abilities → self respect → response bias
(Non cognitive abilities)

→ Trait EI Questionairre → 15 subscales
(Petrides)

- 15 subscales which have 4 aspects
  - ↳ self control
  - ↳ emotionality
  - ↳ Sociability
  - ↳ well being

* Emotional Quotient Inventory (EQI)
(Bar-on)

⇒(Emotional Reasoning is tested & not EI in these tests)

Bar-on→characteristics
(i) Intra personal Management

(ii) Inter personal Management

(iii) Stress Management

(iv) Adaptality

(v) Knowledge & Management of general mood

Acc. to Bar-on, EI is an array of non-cognitive capabilities & skills that enhance one's ability to succeed in coping with environmental demands & pressure.

Acc. to Petrides, emotional intelligence is seen as individual self-perception of their emotional abilities including behavioural & personal abilities. These traits are measured by the respondent's self-report. It assumes that the respondent is able to accurately describe his/her own traits. This model can be viewed in conjunction with comprehensive exploration of person's personality. EQ therefore is the constellation of emotional self-perceptions located at lower levels of personality

(iii) Mixed Model
* Goleman's Model mixes personality traits with intelligence.

characteristics of EI ⟶ (i) Self awareness
(ii) Self Motivation

(iii) Self Regulation
(iv) Empathy
(v) Social skills

(i) Self Awareness → a) knowledge about oneself
b) strengths & weaknesses
c) realistic goal setting
d) frequent goal accomplishment
↓
This increases self-motivation

(ii) Self Motivation → a) Energy for action
b) Keep disappointment away
c) take risks

(iii) Self Regulation → a) Self control
b) Delayed gratification
c) Prevents a person from becoming prisoner of ~~your~~ his feeling
d) Trustworthiness
(You deal with others with fairness & equanimity)
e) Adaptability
f) conscientousness
g) Innovative

(iv) Empathy → a) Understand & feel the emotions of others
b) service Orientation
c) Leverage diversity
d) Develop others
e) Take other's perspective

Empathy + Self Regulation → Great Teamwork

(v) Social skills ⟶ a) Openness
b) Agreeableness
c) Social Control
d) Co-operation & collaboration

Goleman's model ⟶ Emotional Social Competence Inventory (ESCI)

* ~~Di~~ EI & EQ Relationship

EI $\xrightarrow{\text{Socialization}}$ EQ [Steve Hein]
(inborn)
(Degree to which EI has been realised)

→ EI is a potential which is inborn

→ High EI, low EQ possible but not vice versa.

→ Amount of Socialization will determine the degree of EI developed (esp. during early years) [5 yrs] ⟶ attachment relationship with mother & significant others

* Development of Emotional Intelligence

↳ Marshmallow Test (5 yrs) → Walter ~~Mist~~ Mischel ~~(8 yrs)~~

→ Children were given marshmallow ~~to eat~~ and asked to wait for 20 mins. If they wait, they will get one more

→ Those children which showed delayed gratification were found to be more successful in professional & personal life in later life.

Techniques to develop EI

(i) Assertiveness Training
(ii) Response Shaping
(iii) Sensitivity Training
(Tell the person how his behaviour effects others)
(iv) Role Playing
(v) Ego inflation → exteem building exercises
(vi) Realistic goal setting (fails due to poor awareness level)
(vii) Awareness Building exercise
(viii) Positive imagery & +ve self talk
(ix) Stress Inoculation Training
↳ Graded exposure to feared situation
(x) Extinction & Time Out
↳ If you do something wrong, you are not allowed to use that thing (eg. if bad behaviour is shown while watching TV then don't allow to watch TV)

Multiple Intelligence

MI differentiates Int. into specific modalities rather than seeing it as dominated by single general ability. Gardner defines Int. as a product that is valued within one or more cultures. This particular definition emphasises the creative & practical as well as hypothetical & abstract aspects of person's intellectual abilities.

Gardner in his book 'Frames of Mind' identified following characteristics of human intelligence:

(i) He described human intelligence as a set of skills that enables a person to solve genuine problems encountered in life

(ii) Ability to create effective product or offer a service that is valued in the society.

(iii) Potential for recognition & for creation of problems, thereby establishing the necessity for new knowledge.

Gardner has based his work on multiple intelligence on certain principles & these are:

(i) Intelligence is not singular but infact is multiple.

(ii) Every person is a unique blend of dynamic intelligences.

(iii) Intelligences vary in development both within and among individuals.

(iv) Intelligences are dynamic & therefore are constantly subject to change.

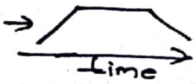
(v) Multiple intelligences can be identified & described.

(vi) Every person deserves the opportunity to recognise & develop his multiple intelligences.

(vii) Use of one intelligence can enhance the other.

(viii) Pure intelligences can be rarely seen.

(ix) Developmental theory applies to the theory of Multiple Intelligence. (DT→



)

(x) Personal background, density & dispersion are critical to the knowledge, beliefs & skills on all intelligences

(xi) All Intelligences provide alternate resources & potential capabilities to become more human, regardless of age & circumstances.

(xii) Any list of intelligences is subject to change as we learn more about multiple intelligences.

* Why should one study intelligence?

(i) Classification of human intellectual competencies will allow for better understanding of humanity.

(ii) Identification of human strength is likely to enable the researchers to communicate more accurately about the concept of human intellect.

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Intelligences given by Gardener

(i) Logical - Mathematical Intelligence
(scientists, engineers)
↳ think logically
↳ hypothetico-deductive reasoning
↳ detect patterns

(ii) Linguistic Intelligence
(writers, poets)
↳ mastery over language
↳ use language to express oneself effectively
↳ Use language to remember information
↳ Ability to read between the lines

(iii) Spatial Intelligence
(architects, surgeons)
↳ ability to create & manipulate mental images to solve problems.

(iv) Musical Intelligence
(composers, singers)
↳ understand & appreciate various aspects of music such as pitch, timbre, rhythm, etc.

* Illiterate are the people who donot sing & dance.
↳ Music is a universal language → Thus, people who cannot enjoy it are illiterate.
↳ Culture unites though politics unites.
↳ This statement is not correct denotively but is correct metaphorically.

(v) Bodily Kinesthetics Intelligence (BKI)
(dancers, athletes)
↳ psycho-motor co-ordination
↳ muscular dexterity
↳ co-ordinate one's bodily movements

(vi) Personal Intelligence (Socio-emotional Intelligence)
(Therapists, preachers, actors, politicians)
↳ Intrapersonal → self awareness

↳ Interpersonal → ability to regulate emotions of others.

(vii) Naturalistic Intelligence
(farmers, photographers)
↳ ability to appreciate, understand the things that happen in nature eg. understand behaviour of animals, what kind of climatic developments is take place

(It is sometimes called 8 Int. of Gardner ⇒ if Personal Int. is taken as 2 separate → Intra & Inter)

Empirical evidence in support of Gardner

(i) Brain damaged patients

(ii) Isolated Talents

(i) Only that int. was lost pertinent area of which was damaged. eg. Broca's area

(ii) Idiot Savants → extra-ordinary int. in a specific area (only that particular area of brain is very well dev.)
eg. William's syndrome
(very high musical intelligence)

* Criticism of Gardner

(i) He has divided human intellect in an arbitrary fashion
eg. BKI → Actor
→ Dancer
→ Mechanic
⇒ A good actor should be a good mechanic

(ii) He said that the 8 types of int. are relatively autonomous but we find a +ve correlation bet. them.

(iii) Some intelligences present in all cultures are not considered eg. culinary, spiritual

↳ Thus, his list is not an ~~ex~~ exhaustive one.

(iv) Gardner did not provide any test for his multiple intelligences.

(MIDAS Test was made by Shearer)

(v) Int. is broad based, these intelligences are in a very narrow domain. They should be called 'aptitudes' & not intelligence.

Measurement of Multiple Intelligence

* MIDAS (shearer) → Multiple Int. Development ~~Assessment~~ Assessment Scale.

MIDAS was designed to provide an objective measure of multiple int. as reported by the person or a knowledgable informant. The questionaire takes about 25 mins. to complete. The 119 intellectual traits cover 8 areas of abilities, interests, skills & Activities. The user is asked to read each cognitive characteristic & then select what he perceives as the best answer at this point in time in his life. It is imp. that the responses to each of the intellectual characteristics are realistic. There are no right or wrong responses. The user does not have to answer & guess at every question as each item has 'does not apply' choice. There are many variants of MIDAS:

a) MIDAS for adults

b) Teen MIDAS (14-18 yrs.)

c) MIDAS for kids "all about me" (10-14 yrs.)

d) MIDAS for kids "my child" (6-9 yrs.)

* Application in Education

(i) Guidance & counselling
(ii) Curriculum designing
(iii) Appreciate & respect Individual Differences (other abilities than verbal & numerical)
(iv) Multimodal approach to education

Measurement of Intelligence

- Francis Galton
- Simon - Binet
- Terman → used it for the first time in his Int. Test
- Wechler → DIQ (performance + intelligence measurement)
- Stern gave IQ = $\frac{MA}{CA} \times 100$

- Terman in 1916 gave SBIT (Stanford Binet Int. Test) (1960 revision of SBIT → DIQ was used)
- Wechler gave the concept of Deviation IQ
  ↳ WAIS → DIQ was used (comparision of IQ among diff. age groups)

- In 1905, Simon Binet gave his test but it was based on the work of Spearman (1904)

⇒ Francis Galton worked on Individual Differences w.r.t. ability to process information.
↳ He thought that by measuring sensory abilities (acquity) & psycho-motor abilities, he can measure intelligence.

⇒ James Mckeen Cattell was the first person who used the term 'Mental Test'

⇒ Simon & Binet gave first test to identify ~~&~~ sub-normals who need special instruction
↳ They came up with the concept of mental age.
↳ Developed a test based on age levels.
↳ They calculated mental age by calculating Basal Age & Ceiling Age
↳ Based on Spearman's work

- Simon & Binet
  ↳ 6 items
  ↳ each item will have 2 months of credit of mental age

⇒ They selected a large sample from the pop. & if 3/4 th members of the sample of that age group could answer it correctly ⟶ That item was chosen.

eg.
7yr old → All 6 questions correctly

Basal Age → 7

* The highest level of which all items can be answered correctly → Basal Age

eg. 7 yr old child can answer only 3 question for 9 year old, but all for 8 yr old ⟶ Basal Age is 8yrs

9yr old → 3 items
10yr old → 3 items
11yr old → All items wrong (Ceiling Age)

∴ Mental Age = 8yrs + 3(2) + 3(2)
= 8yrs. + 6months + 6months
= 9yrs.

Chronological ~~test~~ Age = 7yrs.
Mental " = 8yrs.

* Challenges associated with Int. Measurement

(i) Culture bias ⟶ a) Language
(test english favours whites)
(b) Constructor's culture will be a bias in the test.

(ii) Int. Test should be ~~an~~ a general aptitude test but it becomes in part an achievement test. eg. Coaching affects scores in Aptitude Tests like CAT.

(iii) Cutoff

↳ If 140 IQ is genius, what about people with Score 139 IQ

(iv) Intelligence is a broad based ability, thus tests have in completeness

(v) Absence of absolute 0 → relativity in measurement

(vi) Definition of intelligence is a challenge even today.